Aura Validation Data Center (AVDC) report

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http://avdc.gsfc.nasa.gov

Outline

- Status
- Cal/Val support
- Validation data centers
- Dataset examples
- Future plans

Status

Status

- Routine operations on-going on http://avdc.gsfc.nasa.gov
  - *Hardware: computing nodes 28, 80 TB storage*
- Currently 360 registered users
- 2010/2011 statistics
  - *~5 M pages accessed*
  - *~10 TB data downloads*
- Total data volume:
  - *correlative groundbased, balloon, …: ~500 GB*
  - *satellite data: ~25 TB*

Available datasets

- Continue to mirror all Aura L2 data from DISC
- Convert, harmonize and maintain correlative datasets
  - *LIDAR, balloon sondes, FTIR, MWR, UVVIS DOAS, Brewer, Pandora*
- Maintain Aura related campaign archives or related data
  - *DISCOVER-AQ, Fairbanks BrO campaign (2011), GloPac, MOHAVE,...*
  - *Mirror aircraft/large balloon missions, e.g INTEX-A/B, AVE, …*
- Continue to host and convert preliminary, experimental, and complimentary satellite datasets
  - *OMNO2 L3 (0.25 x 0.25 and 0.05 x 0.05 deg)*
  - *AIRS, Scisat ACE, NOAA 16-18 SBUV v8 profiles*
  - *MetOp GOME2 (O3, NO2, SO2), Envisat GOMOS, MIPAS, SCIAMACHY, ERS-2 GOME L1/L2*
  - *GOSAT*

Cal/val support

Data subsets, collocations, and instrument field of views

- Sub-setting is updated as Aura L2 data becomes available (HDF5 and ASCII). NDACC sites and other key profiling stations:
  - OMI O3, Aerosol, NO2, UV, SO2
  - MLS, HIRDLS, and TES
- Subsetting of non-Aura data
- MODIS, GOME-2, GOME, SCIAMACHY (on request)
- Campaign and regional sub-setting on request
- Contact AVDC for information/additional requests
- Aura, Aqua, and Terra FOVs
  - Regular 16-day instrument FOV predictions for stations and campaigns
  - Predictions in support of PIs and campaigns
  - Actual coincidences and collocations for 4D search others instruments easily added, e.g. Cloudsat and Envisat for campaigns

Cal/Val support tools

- Continue direct PI support
  - Mainly in sub-setting and data conversion

- Tools and documentation on-line
  - Generic Earth Observation Metadata Standard (GEOMS)
  - Creation of HDF datasets (idlcr8hdf + TAV)
  - Conversion Data Suite (CDS): *convert from NDACC Ames, WOUDC, ...*
  - Download tools
  - Aura ST and WG documentation and presentations

- HDF4/5 read/write available for correlative data

Validation data centers

Data discovery and access

- Public data
  - Overpass, FOV, Aura L2, some campaign data
  - Since 2010/05 public http index directory (FTP-like):
    http://avdc.gsfc.nasa.gov/pub/

- Restricted and semi-restricted data
  - Correlative data
  - AVDC data exchange protocol
  - Since 2010/05 restricted http index directory (FTP-like):
    http://avdc.gsfc.nasa.gov/pub2/
    easier access to data with automated services
  - Data hosting on dedicated AVDC sub-sites
    e.g. preliminary, campaign data

GEOMS

- Generic Earth Observation Metadata Standard (GEOMS) facts:
  - http://avdc.gsfc.nasa.gov/GEOMS
  - Shared standard of AVDC, EVDC, GECA, NDACC, ...
  - Published in Mar 2011
  - AVDC fully compliant since Aug 2011. Old data still accepted until end of 2011

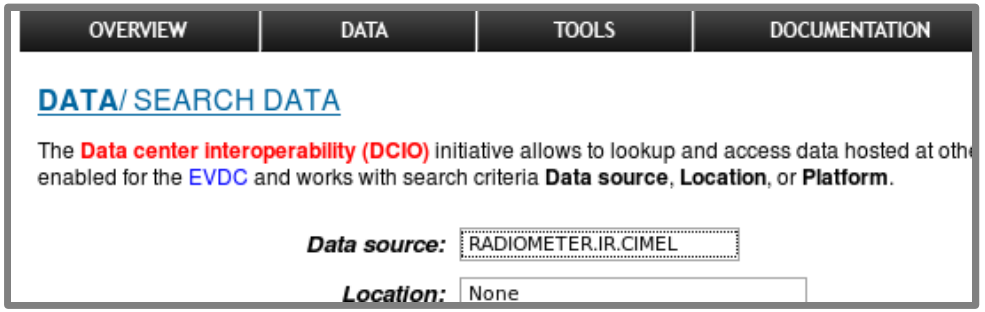
- GEOMS applications:
  - Atmospheric datasets
  - Datasets from ocean and land observation, e.g. buoy, SST, SSP, LAI

- Mapping and conversion of other data formats and metadata standards:
  - NetCDF (including CF)
  - NASA Ames
  - WOUDC

Data center interoperability

dcio
data centre inter-operability

- Joint effort by ESA GECA and NASA AVDC, with partners: NDACC, EVDC, EARLINET, GEOMON, WOUDC: http://avdc.gsfc.nasa.gov/DCIO
- Data centers with correlative observations share same catalog metadata for data search and access
- Interoperable data centers through enabling remote query, catalog replication, data ordering and/or systematic mirroring
- Joint data exchange protocol in preparation (openID enabled)
- File metadata preferably GEOMS



DCIO datasets and tools

- Actual and potential datasets available to AVDC users through DCIO
  - NDACC
  - WOUDC, other WDCs?
  - Envisat validation
  - GECA future ESA EO satellite data
    includes atmosphere, ocean, land data
  - EARLINET
  - Radio Occultation

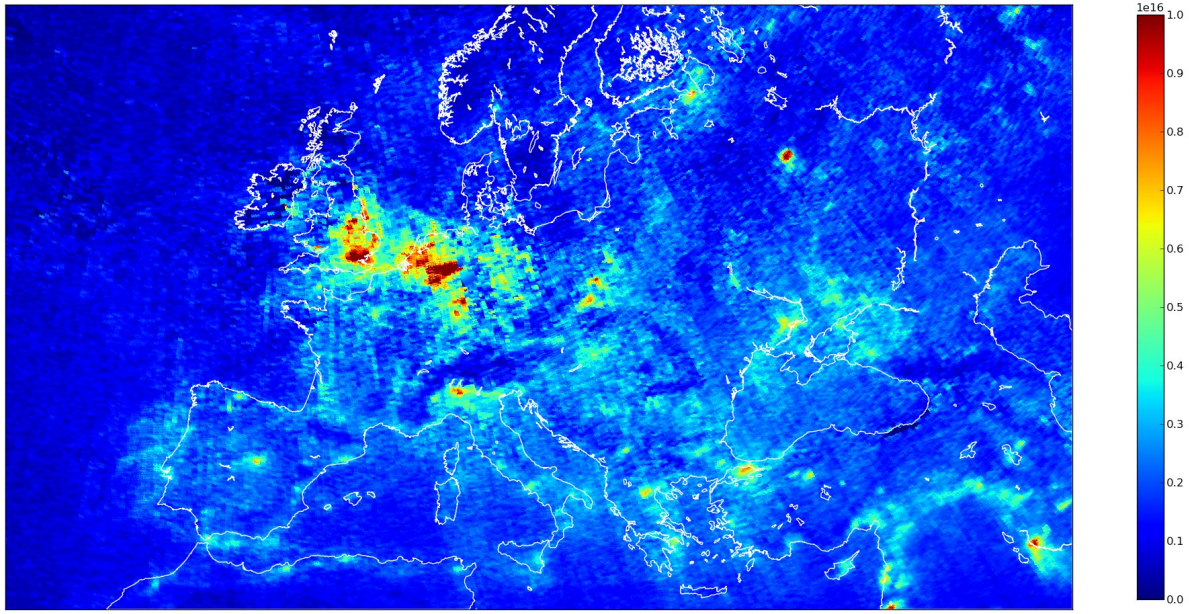
- Open-source data conversion tools

- GECA open-source building blocks (libraries) for collocation algorithms
  both for the users local use and for the data centers

Dataset examples

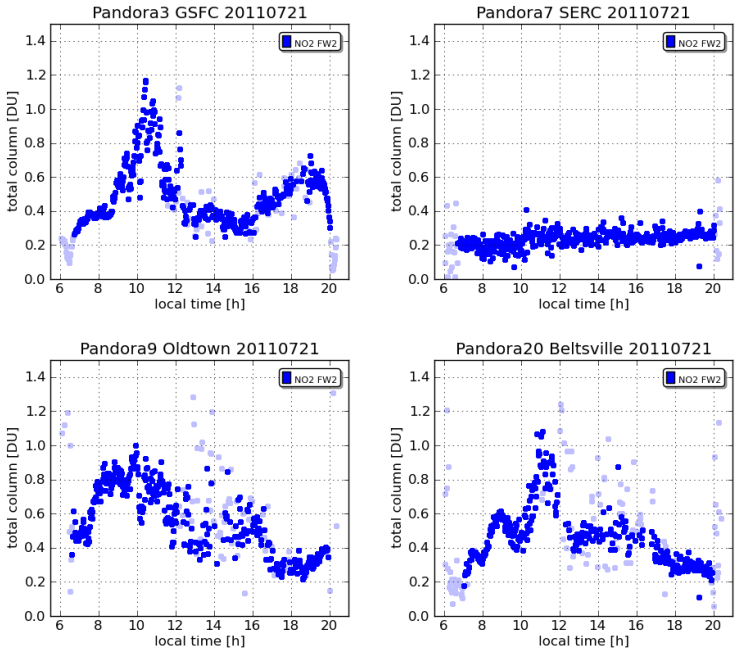
Datasets 1: OMNO2 L3

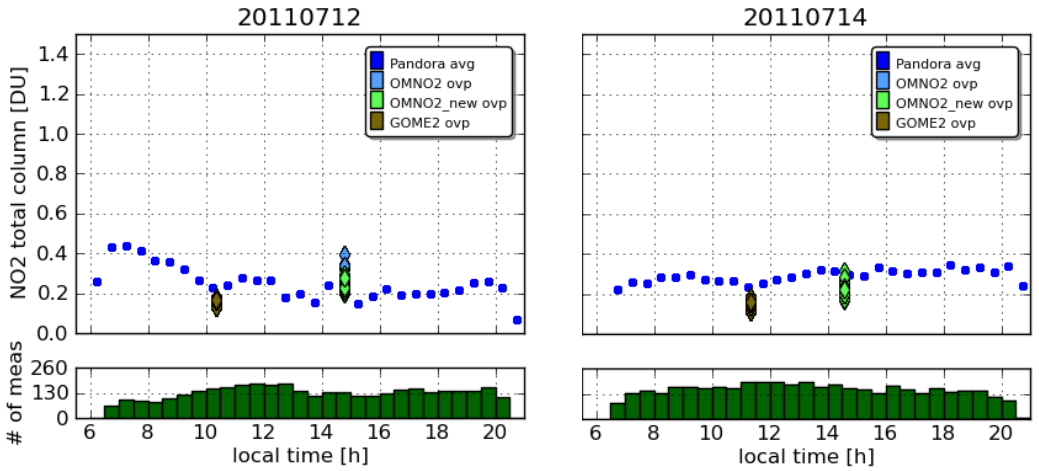
Routine processing for daily and monthly OMI NO2 tropospheric and total column maps available as images, HDF5 or Google Earth files (Scientific product for N. Krotkov). Product updated once new OMI NO2 data is available. Fig: August 2011 average tropospheric NO2 column.



Datasets 2: DISCOVER-AQ: Pandora

Operational processing and monitoring of direct sun Pandora O3 and NO2 products. 12 instruments deployed in the Baltimore/Washington metro area in Jun – Aug 2011. Figs 1 (left): Diurnal variation of NO2; Figs 2 (right): Area averages data for Pandora NO2 + satellite overpass

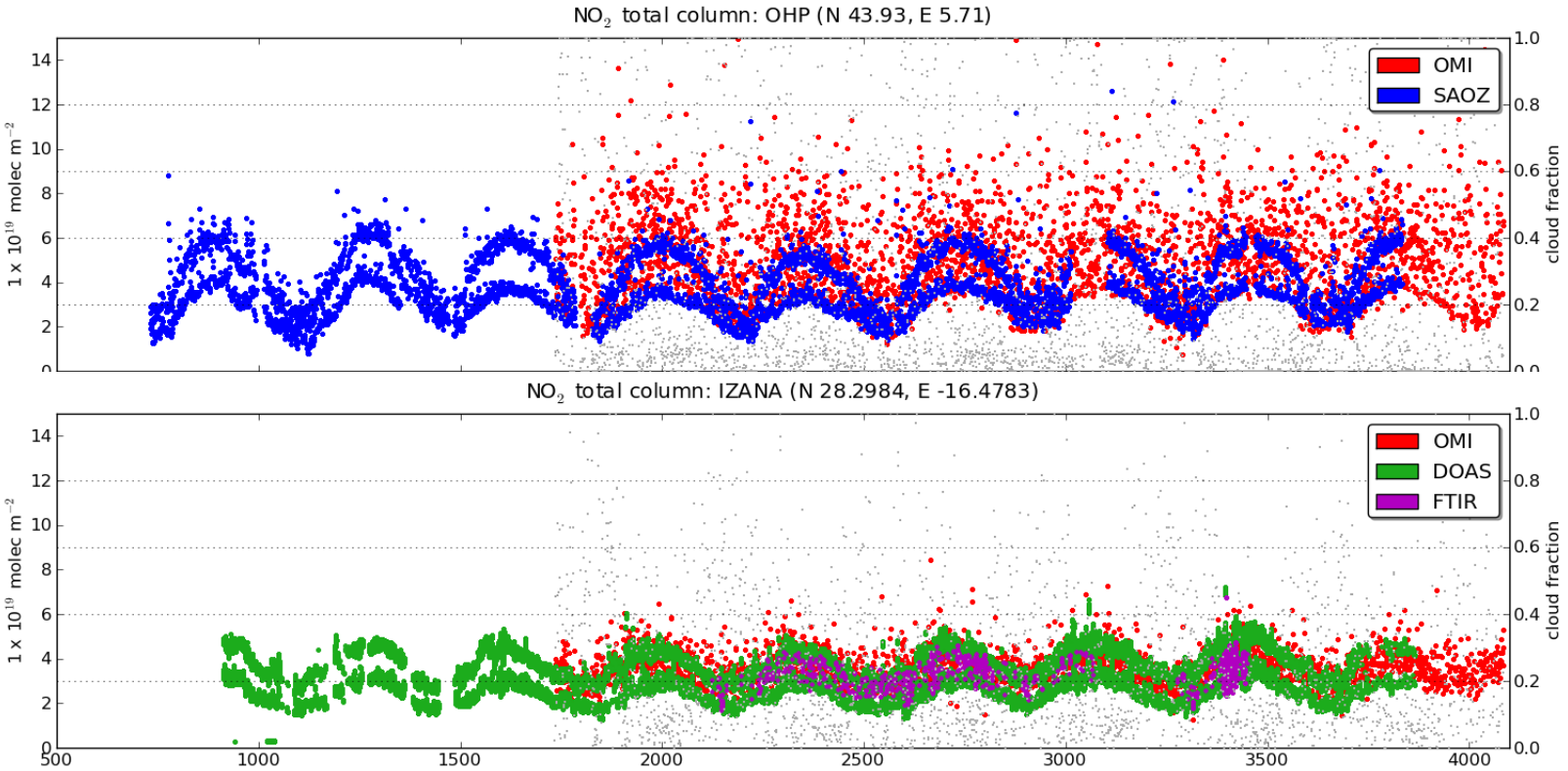




J. Herman, A. Cede, N. Abuhassan,
M. Tzortziou, C. Retscher, M. Kowalewski

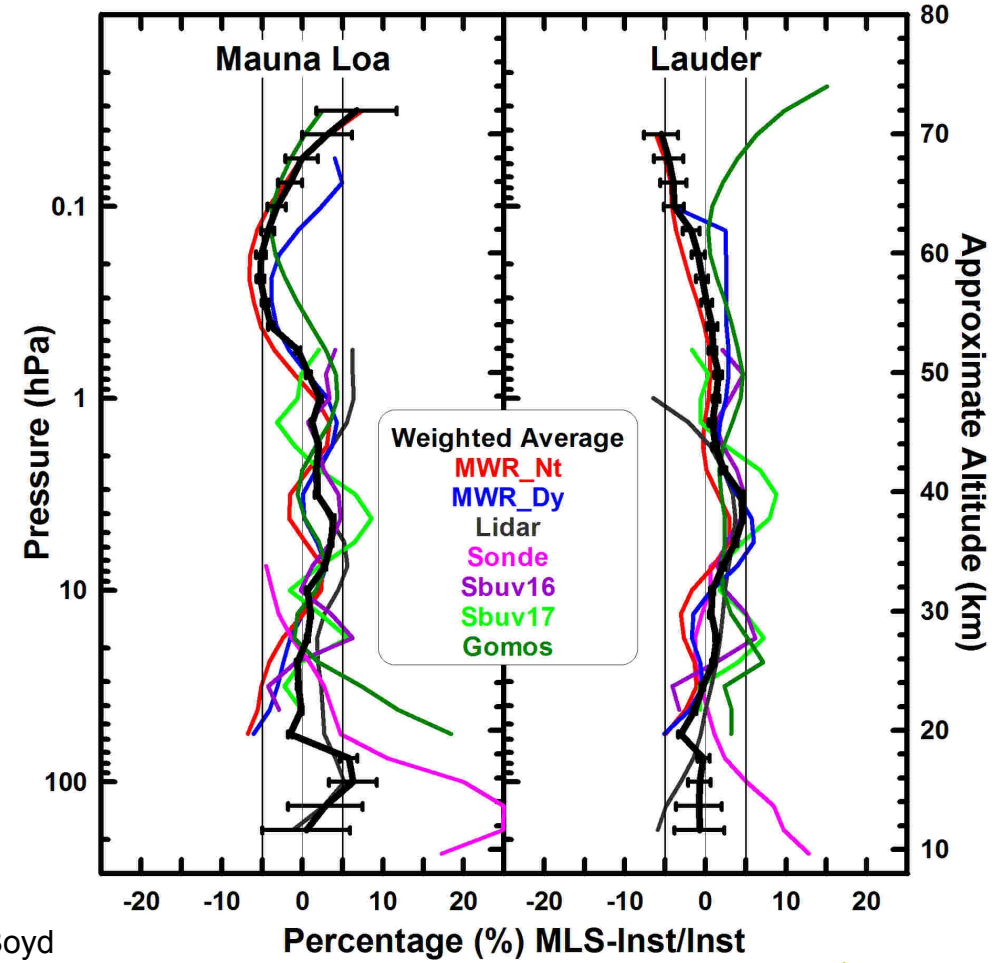
Datasets 3: Timeseries sat vs. ground

Comparison of matching AVDC overpass data with groundbased observations, e.g. SAOZ, FTIR, UVVIS DOAS vs. OMI column NO2



Datasets 4: Multi source comparison: O3

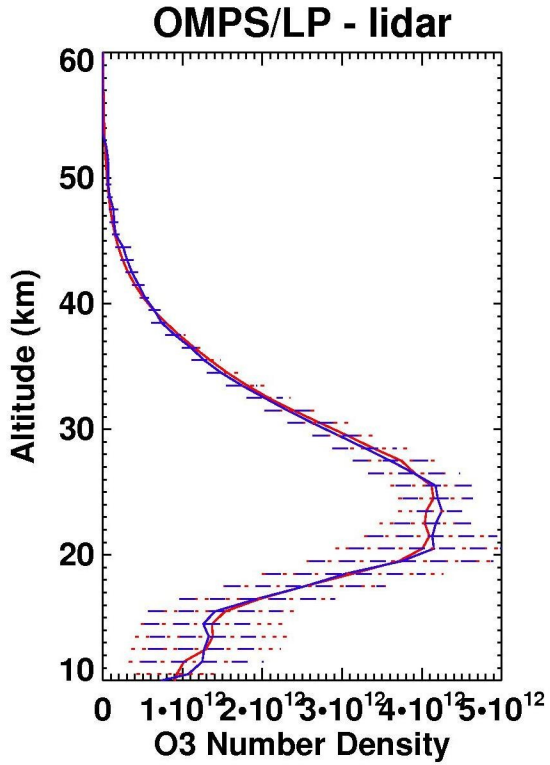
2004 – 2010 ozone profile comparison for stations Mauna Loa and Lauder: MLS vs. MWR, LIDAR, sonde, SBUV and GOMOS.

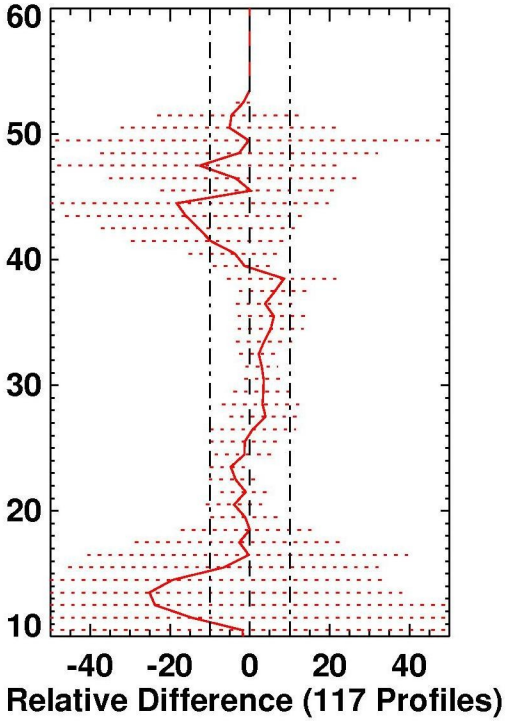


I. Boyd

Datasets 5: OMPS O3 profile comparison

Sep 2009 simulated OMPS Limb profiles vs. LIDAR profiles.

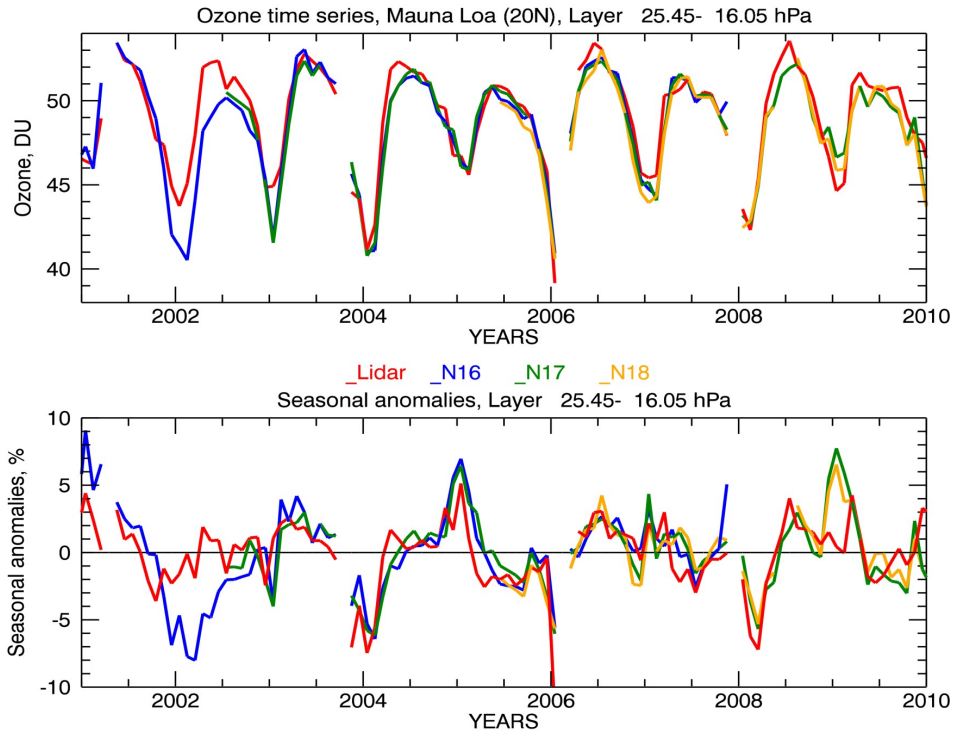




G. Taha

Datasets 6: SBUV vs. LIDAR

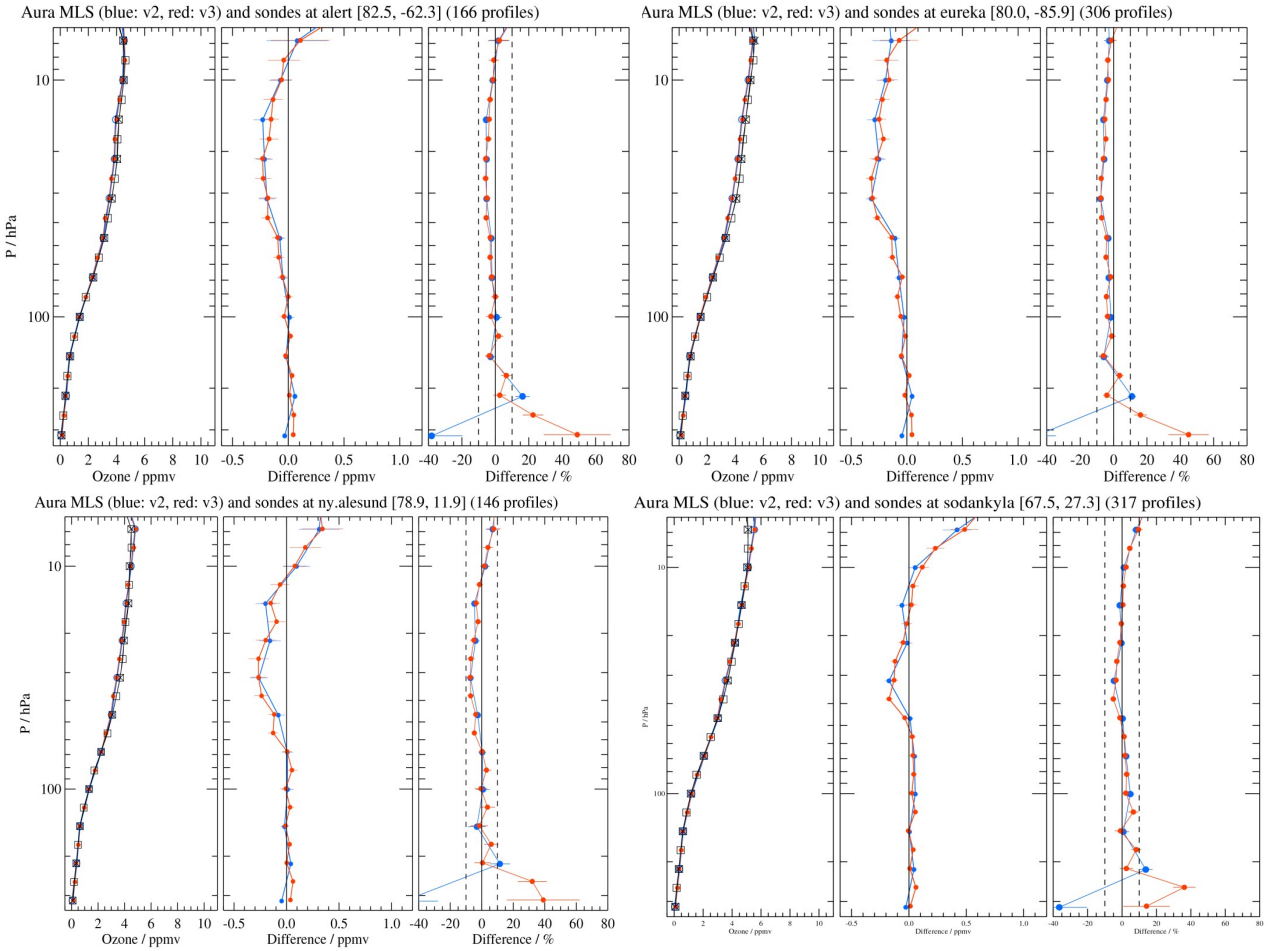
Study of short and long-term ozone variations. SBUV provide a 40-year record of ozone profiles (1970-2011). Validate long-term SBUV time series by comparing them with ground based and satellite vertical profile observations. Here: Mauna Loa station where seasonal ozone variations are relatively small.



N. Kramarova, S. Frith, R. Mcpeters

Datasets 7: Sonde vs. MLS data

MLS (v2.2 (blue) and v3.3 (red)) vs. sondes at high N. lats: Alert, Eureka, Ny Alesund, Sodankyla



L. Froidevaux

Future plans

Up & Coming

- Focus on long-term validation
  - Collect, update, harmonize, and convert ground datasets
  - Data completeness
- Continue ESA (GECA) and NDACC efforts
  - Share datasets and coordinate submissions
- Continue support for NPP/OMPS LP, investigate support for JPSS
- Include new data centers and data sources
  - AERONET, MPLnet
- Proactive on AVDC side but need support from cal/val and instrument teams

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